

EXHIBIT 16

unipolar

ADJECTIVE (& NOUN)

Etymology

Summary

Formed within English, by compounding.

< **uni-** *comb. form* + **polar** *adj.* Compare **bipolar** *adj.*...

Meaning & use

1. Physics.

- 1.a. Produced by or proceeding from a single magnetic pole; exhibiting or employing a single polarity (magnetic or electrical). **1806-**

1806 M. Herman..has divided them into insulated bodies, into perfect and imperfect conductors, and into **uni-polar** and bi-polar bodies, according as their conductible property manifests itself at both, or only at one of the extremities of the pile.

Philosophical Magazine vol. 24 185

1873 The property produced by magnetism in transparent bodies of twisting the plane of polarization of the incident light, is, like magnetism itself, a **unipolar** property.

J. C. Maxwell, *Treatise on Electricity & Magnetism* vol. II. 7

1878 Platinum-plates, charged with prolonged electricity, could bring about this relapsing anæsthesia; also a single electrode of an isolated pile, that is to say, a rigorously **unipolar** application.

British Medical Journal 12 October 552/1

1893 The electrode may be applied in a '**unipolar**' or in a 'bipolar' manner.

D. Turner, *Manual Pract. Med. Electr.* v. ii. 238

1987 The charge clouds in the regions between flame and each electrode are **unipolar**.

Nature 17 December 635/1

2004 The interaction of a strong electric field with the space charge near the surface of

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- 1.b. Of apparatus: having, or operating by means of, a single magnetic pole; (of a generator or 1876- motor) involving or employing unipolar induction (= **homopolar** *adj.* 2).

1876 A **unipolar** magnetic needle.

Nature 20 July 263/2

1883 The remarkable machine of Messrs. Siemens and Halske, called the **unipolar** machine.

Daily News 10 September 2/2

1920 **Unipolar** machines have not been able to compete with heteropolar types.

Whittaker's Electrical Engineer's Pocket-book (ed. 4) 139

1975 The satellite Io acts as a **unipolar** inductor and a source of constant e.m.f. across the Io flux tube as it moves through the Jupiter magnetic field.

Nature 6 February 416/2

2012 The circuit of a **unipolar** stepper motor is very simple.

J. Sanchez & M. P. Canton, *Embedded Syst. Circuits & Programming* xv. 382

magnetism

electrical engineering

2. Biology.

- 2.a. Of a nerve cell: having a single process (typically an axon); (in later use also) having only 1853- one dendrite.

1853 At the extremity of each branch, there is seated a ganglionic cell, fixed on it 'like a pear by its stalk', and hence '**unipolar**'.

Assoc. Medical Journal 18 November 1016/1

1872 **Unipolar** cells exist in some of the lower orders of animals.

A. Flint, *Physiology of Man* vol. IV. i. 46

1880 **Unipolar** nerve cells..are alleged to exist in the ganglia on the spinal nerves and elsewhere.

H. C. Bastian, *Brain* ii. 48

1947 The *motor neurones*..are mostly **unipolar** and their axons form an *efferent* or *motor nerve*.

A. D. Imms, *Outline Entomology* (ed. 3) ii. 26

2005 **Unipolar** brush cells have been found in many mammalian species, including macaque monkeys.

A. B. Butler & W. Hodos, *Comparative Vertebr. Neuroanat.* (ed. 2) xiv. 254/2

life sciences

neurology

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- 1878** If the rete remains broken up, then it is known as a diffuse, **unipolar**, or monocentric rete mirabile.
F. J. Bell & E. R. Lankester, translation of C. Gegenbaur, *Elements of Comparative Anatomy* 597
- 1924** The whole forming a simple rete, differing from those of Müller's **unipolar** type only in the fact that the individual twigs do not anastomose to form a true plexus.
Philosophical Transactions (Royal Society) B. vol. 212 228
- 2009** After leaving the rete mirabile in an **unipolar** rete the capillaries almost directly supply a special area of the swimbladder epithelium.
B. Pelster in M. L. Glass & S. C. Wood, *Cardio-Respiratory Control Vertebr.* 71

life sciences

anatomy

physiology

- 3. Electronics.** Of a transistor or similar device: involving conduction by charge carriers of a single polarity. **1952–**

- 1952** In order to distinguish between the more conventional transistors and the analog types, we propose to use the words *bipolar* and **unipolar**.
W. Shockley in *Proceedings IRE* vol. 40 1313/1
- 1973** Most integrated circuits produced in the 1960's were of the bipolar type, but production of the newer **unipolar** type is growing rapidly.
Scientific American August 48/2
- 1981** The FET..is an example of a **unipolar** device.
J. C. Sprott, *Introduction to Modern Electronics* viii. 169
- 2011** The **unipolar** semiconductor lasers, realized as quantum cascade lasers, belong to the three-level laser type.
K. F. Renk, *Basics Laser Physics* (2012) xx. 371

electronics

- 4. Psychiatry.** Of a mental illness: characterized by symptoms of only one category of affective disorder; *spec.* designating depression in which there is no element of mania; cf. **bipolar disorder** *n.* Also: affected by such an illness. **1965–**

- 1965** We..have assumed that 'middle age depressions' according to Stenbäck and 'unipolar depressions' according to Leonhard are merely different terms, which..cover the same nosographic entity.

- 1997** Deprenyl and phenylalanine, used together, achieved a 'full recovery' in 65 percent of patients who were suffering from clinical unipolar depression.
D. Singh Khalsa & C. Stauth, *Brain Longevity* xix. 397
- 2009** The unipolar patients tended to be insecure and introverted.
P. R. Robbins, *Understanding Depression* (ed. 2) i. 25

psychiatry

5. Politics. Characterized by the dominance of a single nation.

1990–

- 1990** It has been assumed that the old bipolar world would beget a multipolar world with power dispersed to new centers... The immediate post-Cold War world is not multipolar. It is unipolar.
C. Krauthammer in *Foreign Affairs* vol. 70 23
- 1990** Now is the unipolar moment.
C. Krauthammer in *Foreign Affairs* vol. 70 24
- 1992** Those who talk of a unipolar world confuse America's unmatched military might with a preponderance of real power.
New York Review of Books 9 April 40/3
- 1998** In the wake of Soviet collapse, the 'unipolar' globe needed an overarching theory.
Independent 23 April i. 14/7
- 2003** To be a neocon today is to believe that the optimal world is one in which the United States asserts its might and promulgates its ideas, embracing its 'unipolar' status, whether or not other nations agree.
Vanity Fair (New York) July 117/2
- 2014** The Francis Fukuyama moment—when in 1989 Westerners were told that liberal democracy was the final form toward which all political striving was directed—now looks like a quaint artifact of a vanished unipolar moment.
New York Review of Books 10 July 53/1

politics

Pronunciation

BRITISH ENGLISH

U.S. ENGLISH

/juːniˈpəʊlə/

/juːnəˈpəʊlər/

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unipolar typically occurs about 0.7 times per million words in modern written English.

unipolar is in frequency band 4, which contains words occurring between 0.1 and 1 times per million words in modern written English. More about OED's frequency bands

Frequency data is computed programmatically, and should be regarded as an estimate.

Compounds & derived words

Sort by Date (oldest first)

unipolar induction, n. 1856–

Electrical induction in which a continuous direct...

unipolarly, adv. 1868–

In a unipolar way; with a single pole.

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